

## SUBSTITUTION AS A MEANS OF COHESION IN THE TEXTS OF ZOOLOGY

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### Introductory

Substitution is a type of cohesive relations. It is very closely connected with the other two types of cohesive relations – reference and ellipsis. Some linguists define substitution as zero anaphora (Hockett, 1958, 259), though this type of anaphora is different from the anaphora of reference. The anaphoric pronouns that are defined as referring elements are often treated as substitutes; however, Hasan (1968, 82–145) makes an explicit distinction between substitution and reference. A borderline between reference and substitution is also drawn by Halliday and Hasan (1976), who say that substitution is a relation between linguistic items, such as words or phrases, whereas reference is a relation between meanings. When a reference item is used anaphorically, it sets up a semantic relationship with something in the preceding text which enables the reference item to be interpreted as either identical or contrasting with it in some way.

A substitute signals a tie between two linguistic items; and although it contributes to the semantic structure of the text, the relationship that is set up by substitution is not semantic but lexico – grammatical. Hence,

substitution is a relation between two linguistic items on a lexico – grammatical level, whereas reference is a relation between two linguistic items on a semantic level.

A reference item can be used anaphorically, cataphorically, and exophorically, i. e. it may point in any direction. A substitution item, therefore, is an anaphoric item which constitutes a link with the presupposed item identified in the preceding text. Hence, reference can involve two environments – linguistic and extralinguistic, whereas substitution is a verbal relation in the linguistic environment.

From what has been said it can be inferred that reference and substitution are two distinct types of cohesive relations.

The relation of substitution is created between a substitute and a presupposed item, the place of which is taken by a substitute. A substitute in the text is used as an explicit indicator that something is omitted. To quote Halliday (1985, 297), “the substitute serves as a place holding device, showing where something has been omitted and what its grammatical function would be”. As a rule, the structural function of a substitute is the same as that of a presupposed item.

According to the type of structural units, three types of substitution can be distinguished:

- Nominal.
- Verbal.
- Clausal.

This division was introduced by Halliday and Hasan (1976), and followed by McCarthy (1991), Hoey (1991), Salkie (1995) and others. In this work we have adopted the division and given separate analysis to each type of substitution.

### Nominal Substitution

There are two lexical items that are used as nominal substitutes in the English language. They are: *one/ones* and *the same*. The nominal substitute *one* and its plural form *ones* function as head of a nominal group and can substitute for any countable noun. The substitute *one/ones* presupposes a noun in the preceding predication: the noun it substitutes for is head of the nominal group (Valeika, 1985, 94).

As already known, the lexical item *one* is polyfunctional in English: it can be used as a substitute, as a personal pronoun, a cardinal numeral, an indefinite determiner and a generalised noun.

The personal pronoun *one* is a personal form with the generalised reference; it is not used anaphorically; hence, it has no cohesive power.

The cardinal numeral *one* occurs in the analysed texts quite frequently; sometimes it has anaphoric nature but only when it is used in elliptical structures.

An indefinite determiner *one*, like other determiners, can occur elliptically and function cohesively, but its analysis is beyond the scope of the present study.

The use of the generalised noun *one* is usually restricted to human referents meaning 'people', but it is not anaphoric and has no cohesive force.

The comparative analysis of the three types of substitution shows that nominal substitution is the most common type of substitution used in the analysed texts. 54 per cent of all cases of substitution can be accounted for by nominal substitution. 80 per cent of the cases of nominal substitution are expressed by the substitute *one* and its plural form *ones*; about 20 per cent are expressed by the substitute *the same*.

As already pointed out, the nominal substitute *one* functions as head of the nominal group and it is always modified. The modifying element of the presupposed item is silenced, only the nominal part is carried over.

1.1. *The role of hormones in the process of moulting is even less clear, but since the old feathers are expelled by newly formed ones, hormonal activity is most likely associated with the moulting process by acting directly or indirectly on the feather papillae.*

The nominal part of a noun phrase *the old feathers* is carried over by the substitute *ones*, however, the modifying element *old* is repudiated by a new modifier, *newly formed*.

This does not necessarily mean that modifying elements of the presupposed item could not be carried over. It just demonstrates that there is a contrast between the meaning of the modifier of the substitute and the modi-

fier of the presupposed item. To quote Halliday and Hasan (1976, 95), “the substitute is never identical; there is always some redefinition.”

However, in some cases the modifying element of the substitute may have seemingly identical lexical expression with that of the presupposed item.

1.2. *The retroviruses may be highly oncogenic or weakly oncogenic. The highly oncogenic ones usually comprise four genes, one of which is the viral oncogene.*

On the one hand, *highly oncogenic* is not an entirely new item modifying the substitute *ones*. On the other hand, the function of *highly oncogenic* in the first sentence is different; it is not used as a modifier of the noun *the retroviruses*. Moreover, the point of contrast remains, only it is not between the substitute and the presupposed item, but between the members of the predicative *highly oncogenic* and *weakly oncogenic*. Consequently, the substitute is not identical with the presupposed item.

In 1.2 nominal substitution occurs in the same clause of the same sentence. Hence, the distance between the substitute and the presupposed item is very short. Generally, substitution does not extend over a long passage, it is largely limited to the immediately preceding sentence. Such cases of nominal substitution when the presupposed item is identified in the preceding sentence cover 10 per cent. The rest of the instances exhibit a tie between the substitute and the presupposed item within the limits of the same sentence.

The lexical item *same* can function as a reference item of the comparative type and

as a nominal substitute. It is always used with the definite article if it functions as a substitute.

The substitute *the same* functions as a lexical item, i. e. it can carry the information focus and typically does so when used in final position. Its meaning is: the information conveyed by this item in the context is new, but the item itself has occurred before (Halliday and Hasan, 1976, 110).

The nominal substitute *one*, as has been pointed out, can presuppose the head noun; the substitute *the same* can presuppose an entire nominal group with the modifying elements.

1.3. *Callender and Shumard (1973) found that a partial immunity was developed with monensin <...>. Karlsson and Reid (1978) found that the same was developed with lasalocid.*

*The same here does not mean the same partial immunity*, which would be a case of reference, but it indicates an identical ‘condition’ or ‘fact’ developed by a different drug. Therefore, the meaning of *the same* is new in this context, but the item *a partial immunity*, the place of which is taken by *the same* has occurred in the preceding sentence.

*The same* can presuppose an entire predication, i. e. it can take the place of the nominal and verbal groups with modifying elements.

1.4. *Hurwitz et al. (1980) found that feed intake and weight gain decreased linearly as environmental TA increased above TA of 28 even feed efficiency decreased, especially in males. The same was found by Meltzer (1984) <...>.*

The text above demonstrates the capacity of *the same* to substitute for a whole propo-

sition. In such cases the function of the same is very similar to that of the demonstrative pronoun this.

1.5. *Wilson et al. (1975) indicated that selection for higher oxygen consumption and high heat tolerance resulted in birds with similar characteristics. This was also evidenced by Kafri and Cherry (1984).*

However, the same in 1.4 and this in 1.5 function as reference items rather than substitutes.

The analysis of the data shows that the nominal substitute the same is often combined with the verb do.

1.6. *Heat pasteurization revolutionised the bacteriological safety of milk. Radiation pasteurization could do the same for other products.*

In the text above the verbal element of the immediately preceding sentence is substituted for by the phrase could do the same. The verb do functions as a general verb. The same substitutes for a verbal group although it is of nominal origin. The pattern do the same covers 25 per cent of all the occurrences of the nominal substitute the same.

On the basis of the collected evidence we can point out two main patterns in which the substitute the same is used:

1. The same that substitutes for an entire nominal group.

2. Do the same that substitutes for a verbal group.

The distance between the substitute the same and the presupposed item is very short, very often it does not exceed one sentence boundaries. In some cases, like in 1.3 and 1.6, the presupposed item is identified in the immediately preceding sentence.

The major differences between the nominal substitute one/ones and the same are:

1. One is a grammatical item which contains no lexical content of its own; whereas the same functions as a lexical item: it can carry information.

2. One can only substitute for a head noun, whereas the same can substitute for an entire nominal group with a modifying element; in combination with the verb do it can substitute for a verbal group.

3. One is always modified, whereas the same is not.

4. One occurs far more frequently than the same.

In conclusion we can say that nominal substitution serves as an important means of cohesion creating an anaphoric link between the substitute and the presupposed item. It also serves as a means of language economy since it enables the author to convey the same ideas in a more compact, condensed way. Nominal substitution makes it possible to convey the meaning and function of the nominal group without repeating the same lexical item twice and thus avoid redundancy.

## Verbal Substitution

Substitution in the verbal group is expressed by means of the verb do. It functions as head of the verbal group and takes the place of the lexical verb. The substitute do appears in the appropriate finite or non – finite forms (do, does, did, doing, done). It can substitute either for a verb or for a verb with some other elements in the clause.

2.1. *Fortunately such circumstances seldom arise but when they do the losses can be very high.*

2.2. *The two vaccines differ in that the CV – 988 strain spreads readily from chicken to chicken, while attenuated HPRS – 16 and other attenuated sero – type 1 vaccines do not.*

In 2.1 the verb do substitutes for the lexical verb arise, whereas in 2.2 the verb do not substitutes for a whole verbal group. In both cases the substitute do points back to the presupposed item by way of anaphora. The vast majority of cases exhibit a link within the limits of the same complex sentence; however, a presupposed item is usually identified in the preceding clause of the same sentence.

Generally, verbal substitution accounts for 34 per cent of all the cases of substitution. Texts 2.1. and 2.2 exemplify the most typical uses of the substitute do. However, in some cases do is combined with so.

2.3. *The authors invited to contribute were all carefully chosen from the world community of scientists and scholars to ensure that specialized topics were reviewed by those well – qualified to do so.*

The expression do so is very similar in meaning to the substitute do used singly. The difference is that the form with so combines anaphora with prominence (Halliday and Hasan, 1976, 116). Prominence as the main reason for the use of so is also pointed out by McCarthy (1991, 45). Explicitness is one of the main characteristics of a science text; therefore, the frequent occurrence of the pattern do so is predetermined. For this reason, the pattern do so accounts almost for 35 per cent of all occurrences of the verbal substitute.

Do this is another pattern usually observed in the analysed texts.

2.4. *By allowing a dedicated processor to control the feeder it is possible to incorporate devices for sensing that the chain is working, also to over – ride the clock and to switch the feeder off as soon as the chain is returning full. By doing this, better management of the feeding system results together with potentially better feed utilisation.*

In the text above the verb do functions as a pro – verb but not as a substitute. The verbal group by doing this refers back to the preceding sentence; so that do this can be regarded as a compound reference verb. Therefore, do this constitute a cohesive tie with the preceding sentence by anaphoric reference, but not by substitution. Although the origin of cohesion of the patterns do so, do this and do the same is different, all of them contribute to the integrity of the text creating an anaphoric link with the presupposed item. To quote Hoey (1991, 73), “constructions of do so / the same / this / likewise serve the same function of allowing the speaker or writer to repeat something already said <...>”.

The verb do has other functions, it can occur both as a notional, general verb and as a verbal operator. A detailed analysis of these functions is not the purpose of the present study; however, some observations would help to have a full picture of the polyfunctional use of the verb do.

Notional do has retained its lexical meaning and like other verbs can be substituted for by the verbal substitute do. The notional do cannot function cohesively and does not contribute to the cohesion of the text.

The general verb do is a lexical item with a generalised meaning used in expressions such as ‘to do a dance’. Cases of the generalised

verb do have not been observed in the analysed texts.

The verbal operator do is a purely grammatical element expressing simple present or simple past tense forms.

2.5. *In contrast, Carew and Hill (1961) found that a slight methionine deficiency did not significantly retard growth but did increase fat deposition.*

The text above demonstrates the use of the verbal operator used in the negative form, as in *did not significantly retard*, and in the marked position, as in *did increase*. In neither case, however, the verbal operator functions cohesively.

The position of a verbal substitute in the predication is usually final. The data analysis, however has shown high frequency of the verb do used in inverted position.

2.6. *The residues occurring in other products derived from animals fed DPW require further study, as does the effect of poultry litter obtained from flocks which received excessive chemotherapeutic agents.*

In spite of its initial position, does, as used in the text above, could be attributed to the class of substitutes since it takes the place of the verbal group *require further study*. The inverted position of the verbal substitute could be accounted for by the authors' desire to give prominence to the information encoded by the substitute. Patterns of inverted do also occur in clauses of comparison and the distance between the substitute and the presupposed item never extends over the sentence.

Summing up we can say that verbal substitution is the second most frequently used type of substitution. On the basis of the collected

data the following tendencies of the use of the substitute do can be pointed out:

- The substitute do can take the place of a lexical verb or a verbal group creating an anaphoric link with the presupposed item.
- The substitute do is used in combination with so when the writer wishes to give prominence to the information the substitute carries over from the presupposed item. For the same reason the substitute do is used in inverted structures.
- Verbal substitution does not extend over the sentence boundaries.

## Clausal Substitution

Clausal substitution occurs when an entire clause is substituted. There are two clausal substitutes in English: so and not. Clausal substitution can take positive form, which is usually expressed by so and it can take negative form, which is expressed by not. Halliday and Hasan (1976, 131) indicate three environments in which clausal substitution takes place: report, condition and modality. Later Halliday (1985, 298) noted that the general principle is that a substitute is required if the clause is projected as a report; with modality (perhaps) and hypothesis (if) being treated as kinds of projection.

In general, clausal substitution is a type of cohesive relation which is supposed to be typical of oral speech; however, its role in the creation of a science text is also important and cannot be ignored. The clausal substitution accounts for 12 per cent of all cases of substitution. Not all the three environments of clausal substitution find equal expression in the texts of zoology. It must be noted that

substitution of reported clauses practically is not found. The number of cases of the modalised clause substitution is inconspicuous. Conditional structure, therefore, is a typical environment for clausal substitution to occur.

3.1. *People prefer income, which is less risky to the same income which is more variable. If so, one would expect the quality which would be supplied at any given price to be greater with stable prices.*

Here so substitutes for the whole preceding sentence. The positive form so in the conditional clause substitution accounts for almost 90 per cent of all cases of clausal substitution.

Clausal substitution occurs in a contrastive context. The information the clausal substitution conveys is recoverable from the previous text, but it is placed in a new contrasting context; this contrast does not result in the negation of the previous information, the information is presented in a new light. To quote Halliday and Hasan (1976, 136) "contrast is not necessarily a negation of the context that was there before; there may have been no such context, and even if there was, the presupposing context may be simply a reaffirmation of it. But there is always some redefinition of the environment of the presupposed clause; the speaker or writer is encoding the clause as itself recoverable but in a context which is non-recoverable".

As already mentioned, the substitute so stands for a positive idea, whereas not stands for a negative.

3.2. *Such a question is whether to substitute part of the fine granular limestone (calcium) in the diet with larger particles of calcium carbonate (Ca CO<sub>3</sub>) or not and if so whether to use limestone or oystershell.*

The text above contains two clausal substitutes. The substitute not takes the place of the whole preceding clause and adds a negative meaning to the statement; the substitute so, therefore, stands for the same clause and expresses a positive idea in the conditional environment. This instance of clausal substitution serves both as a means of cohesion and an effective means of language economy. However, as already pointed out, such instances of clausal substitution are not numerous.

## Conclusion

Substitution is a type of cohesive relations contributing to the cohesion and integrity of the text as well as to language economy. In comparison with other types of cohesive relations – reference and ellipsis, substitution is not very common in the analysed texts of science zoology. It accounts for 5 per cent of the cohesive relations. It does not extend over a long passage of the text: the substituted and the presupposed item are identified within the limits of the same sentence. Consequently, such instances are not by themselves cohesive, except for the cases of clausal substitution and a few cases of nominal substitution that cross over the sentence boundaries.

## The Samples for Analysis and the Method of Data Analysis

The scientific texts analysed were drawn from the journal "World's Poultry Science Journal". 2 000 pages of the texts were analysed. The texts were selected quite at random but from the point of view of stylistic

characteristics they were typical pieces of scientific texts on zoology.

The mean – data analysis method was used. The results of relative frequency of the substitution items were received.

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### SUBSTITUCIJA KAIP RIŠLUMO PRIEMONĖ ZOOLOGINIUSSE TEKSTUOSE

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#### Reziūmė

Substitucija – viena iš svarbiausių teksto rišlumo ir kalbos ekonomijos priemonių. Šiame straipsnyje analizuojamas trijų pagrindinių – daiktavardinės

frazės, veiksmazodinės frazės ir sakinio – substitucijų vaidmuo formuojant rišlų zoologinį tekstą.

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